

Selection index under various dispersion structures for experiments in different cropping systems

Marcin Przystalski¹, Hans-Peter Piepho² and Paweł Krajewski¹

¹ Institute of Plant Genetics PAS, Strzeszyńska 34, 60-479, Poznań, Poland

² Department of Bioinformatics, University of Hohenheim, Stuttgart, Germany

Mixed models and index selection theory [1] are frequently used as tools for the analysis of plant breeding and variety experiments. Recently, they have been applied in the analysis of large collection of data resulting from field trials performed in different environments (sites or years) under organic and non-organic cropping systems in several European countries [2]. The main objective of the analysis was to see if the rankings of genotypes tested in the two systems are different and if testing in organic conditions is providing significant information about their performance. For this aim, the estimated variance and covariance components, based on a mixed model, were interpreted in terms of correlation and selection parameters useful for the breeder's decisions. The purpose of the study reported here was to see how to extend the model and the data analysis to the situation where similar questions are asked, but the answer should take into account a more complicated structure of dispersion matrix of the random effects. The need for such an extension, dictated by different characteristics of the organic and non-organic trials, was suggested by the breeders. We show how the extended covariance structure of the model influences the obtained selection indices and inference.

References

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